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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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DARBY & DARBY P.C. P.O. BOX 770 Church Street Station New York, NY 10008-0770			EXAMINER KAPLAN, HAL IRA	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/542,638	<b>Applicant(s)</b> SEELIG ET AL.	
	<b>Examiner</b> Hal I. Kaplan	<b>Art Unit</b> 2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 17-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 January 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Specification***

2. The specification is objected to under 37 CFR 1.71(a) because it does not contain a full written description of the invention.

Claim 23 recites a "shift lat device" which is not disclosed in the specification or shown in the drawings, and it is unclear to the Examiner what this device is.

### ***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the shift lat device of claim 23 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

4. Claims 20-23, 26, and 28 are objected to because of the following informalities: Claim 20, line 7, "off" should be deleted. Claim 20, lines 7-8, "the at least one positive output conductor" lacks proper antecedent basis. Claim 21, line 5, "off" should be deleted. Claim 22, line 6, "the current" and "the difference" lack proper antecedent basis. Claim 22, line 13, "the next" lacks proper antecedent basis. Claim 23, lines 7-8, "the switching grid signals" lacks proper antecedent basis. Claim 23, line 12, "the switch pair" lacks proper antecedent basis, as multiple switch pairs are claimed. Claim 23, line 14, "the magnitude signal" and "the magnitude" lack proper antecedent basis. Claim 23, line 12, "operation;" should be "operation; and". Claim 26, line 3, "the capacitive actuator" lacks proper antecedent basis. Claim 26, line 5, "the rotor blade" lacks proper antecedent basis. Claim 28, line 8, "isolating point;" should be "isolating point; and". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 22-23, 26, and 28-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. The term "higher-frequency" in claim 22 is a relative term which renders the claim indefinite. The term "higher-frequency" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear what the frequency of the alternating current is higher than. Claim 23 inherits this deficiency.

8. Claim 23 recites the limitation "conductive area signals". It is unclear to the examiner what a "conductive area signal" is. Claim 23 also recites a "shift lat device" and subtracting a "shift of the conductive areas of the switch pair". It is unclear to the Examiner what is meant by a "shift lat device" or a "shift of the conductive areas". For examination purposes, it has been assumed that "conductive area signals" are the control signals of the switchable semiconductors, and that a "shift of the conductive areas" means that the control signals, and thus the open/closed positions, of the switches have changed during operation.

9. The term "aerodynamically effective" in claim 26 renders the claim indefinite. The term "aerodynamically effective" is not defined by the claim, the specification does not provide a standard for determining aerodynamic effectiveness, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For examination purposes, it has been assumed that an aerodynamically effective device is

a device, used in an aircraft, which functions properly, and does not affect the airworthiness of the aircraft.

10. The term "higher-frequency" in claims 28-29 is a relative term which renders the claims indefinite. The term "higher-frequency" is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear what the frequency of the alternating current is higher than. Claims 28 and 29 also recite direct current (DC) power with a lower frequency than the alternating current (see claim 28, lines 4-5 and claim 29, lines 3-4). These recitations are improper as DC power does not have a frequency.

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 17-21 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the US patent of Hirai et al. (5,798,622) in view of the US patent of Jang et al. (6,934,167) and the US patent of Jaenker (6,231,013).

As to claim 17, Hirai discloses a non-contact electric power transmission system (see Figure 35) including a stationary part (left side of vertical line defined by elements 362,363,363<sub>2</sub>) and a moving part (right side of vertical line), power being transmitted between the stationary part and the moving part, the device comprising: an inductive transformer (362) including a primary winding disposed on the stationary part and a secondary winding disposed on the moving part, the inductive transformer (362) bridging an isolating point between the stationary and moving parts (see Figure 35); a frequency generator (361<sub>2</sub>); and at least one actuator element (364<sub>3</sub>) connected to the secondary winding. Hirai does not disclose the claimed series-resonant circuit capacitor; matrix arrangement of switchable power semiconductors; or rotary-wing aircraft.

Jang discloses a non-contact electric power transmission system (see Figure 4) comprising a series-resonant circuit capacitor connected to the primary winding ( $C_p$ ) of an inductive transformer (TR) and including a matrix arrangement of a plurality of switchable power semiconductors ( $S_1, S_2, D_1, D_2$ ) connected to the secondary winding ( $C_s$ ). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have modified Hirai using the teachings of Jang, in order to provide a simple non-contact electric power transmission system with a highly regulated power transfer, while avoiding harmful switching conditions (see Jang, column 2, lines 31-34). Jang does not disclose the claimed rotary-wing aircraft.

Jaenker discloses rotor blades and actuators on rotary-wing aircrafts (see Abstract and column 1, lines 30-44). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have used the system of Hirai in view of Jang in an area of a rotor shaft and rotor head of a rotary-wing aircraft, because it has been held that the environment within which an apparatus is used does not create a patentable distinction (*Ryco, Inc. v. Ag-Bag Corp.*, 857 F.2d 1418, 8 USPQ2d 1323 (Fed. Cir. 1988)), and that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim (*Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)). See MPEP §§2114 and 2144.07.



As to claims 18-19, Jaenker discloses capacitive (piezoelectric) actuators (31,34) used in a rotary-wing aircraft, wherein at least one of the capacitive actuators is disposed in a rotor blade of the rotary-wing aircraft (see column 5, lines 43-50).

As to claims 20-21, Jang discloses switchable power semiconductors ( $S_1, S_2, D_1, D_2$ ) configured to form an output voltage and disposed in a direction relative to only one polarity of the output conductor, but Jang does not specifically disclose the use of unipolar or bipolar semiconductors. However, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to have selected unipolar or bipolar semiconductors, because the selection of polarity values for an electronic device is an engineering decision based upon the system's intended use and the expected requirements of the other systems with which it will interface. See MPEP §2144.04(IV)(A). In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

As to claims 24-25, Hirai discloses the primary winding being disposed on the stationary part of a rotor shaft bearing, with the secondary winding being disposed on the rotor shaft and corresponds to the primary winding, and a sensor disposed on the rotor shaft (see column 3, lines 7-11 and column 33, lines 36-37).

As to claims 26-27, Hirai discloses the use of actuators (364<sub>6</sub> and 364<sub>7</sub>) in rotor blades or helicopters, wherein the actuators are not disposed in the rotor shaft or the static side (see Figure 35). The helicopters of Hirai are inherently aerodynamically effective.

15. Claims 22 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirai in view of Jang and Jaenker, and further in view of the Japanese patent of Kurakawa et al. (07-046864).

As to claim 22, Hirai in view of Jang and Jaenker disclose all of the claimed features, as set forth above, except for the claimed actuator control element. Kurakawa discloses a driver for a piezoelectric actuator which detects the polarity of an error signal through half-wave signals. The charging/discharging currents of the actuator are detected to provide output to the amplifiers and control the position of the piezoelectric actuator (see Abstract). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have modified Hirai in view of Jang and Jaenker with the teachings of Kurakawa, in order to provide electrical isolation in an efficient and inexpensive manner.

As to claims 28-29, Hirai in view of Jang, Jaenker, and Kurakawa disclose a method of providing power to at least one actuator. Jaenker discloses piezoelectric actuators wherein at least one actuator is arranged on a moving part that is separated from a stationary part by an isolating point (see Hirai, Figure 35). The method comprises: generating a high-frequency AC current from a DC voltage using a frequency generator (361<sub>2</sub>) disposed in the stationary part, the high-frequency AC

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current having an amplitude not dependent on any phase angle or amplitude of a reverse voltage (see Hirai, Figure 35); transmitting the alternating current from a primary winding of an inductive transformer (362) that bridges the isolating point (see Hirai, Figure 35) separating the AC current coming from a secondary winding of the inductive transformer (362) in the moving part into positive and negative half-waves or segments of positive and negative half-waves (see Jang, Figure 4, elements  $S_1, S_2, D_1, D_2$ ), and impressing the AC current into the at least one actuator using an electronic control element in a direction such that a length change of the actuator occurs in a desired direction in each half-wave (see Kurakawa, Abstract).

***Allowable Subject Matter***

16. Claim 23 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter:

Claim 23 contains allowable subject matter because, as noted in the Office action dated February 8, 2008, none of the prior art of record discloses or suggests the claimed actuator control element and controller, in combination with the remaining claimed features.

***Response to Arguments***

18. Applicant's arguments filed May 2, 2008 have been fully considered but they are not persuasive.

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19. As to claims 17-22 and 24-27, although neither Hirai nor Jang discloses implementing either system in a rotary-wing aircraft, the recitation of an area of a rotor shaft and a rotor head of a rotary-wing aircraft is an intended use recitation which is not given patentable weight. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). See MPEP §2114.

20. As to claims 28-29, although Hirai indicates that the high-power frequency power generator is controlled by the speed signal and converts the output of the DC power source, Hirai does not disclose or suggest that the higher-frequency AC current amplitude is dependent on a phase angle and amplitude of a reverse voltage. The higher-frequency AC current amplitude is thus independent of any reverse voltage.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hal I. Kaplan whose telephone number is 571-272-8587. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on 571-272-2084. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael J Sherry/  
Supervisory Patent Examiner, Art Unit 2836

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